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i2 SUMMIT

NECROTIC CORE DISTRIBUTION AT THE CORONARY BIFURCATION, AND THE ASSOCIATION BETWEEN SIDE BRANCH BIFURCATION ANGLE AND VULNERABILITY: A VIRTUAL HISTOLOGY INTRAVASCULAR ULTRASOUND STUDY

i2 Poster Contributions
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Background: Ruptured plaque is often seen near the bifurcation, and it has been reported that endothelial cells near the bifurcation have reduced ability to repair damaged cells. Virtual Histology intravascular ultrasound(VH) were used to study vulnerability of the bifurcation and distribution of NC, as well as the association between side branch(SB) bifurcation angle and vulnerability.

Methods: Subjects were 180 patients with 192 lesions, undergoing stent implantation for coronary stenosis and observed by VH prior to percutaneous coronary intervention.53 lesions revealed at the bifurcation were classified the bifurcation group, and 139 lesions that were not revealed at the bifurcation were classified the non-bifurcation group. Site of measurement was 1 slice at the bifurcation for the bifurcation group, and for the non-bifurcation group, a mean ratio was obtained by measuring the culprit lesion at 1 mm intervals. Necrotic core (NC), dense calcium (DC), and NC/DC ratio were calculated using VH.

Results: The bifurcation group had significantly more NC with 15.8±7.3% in the bifurcation group and 11.0±6.7% in the non-bifurcation group ($p<0.05$). There was significantly less DC in the bifurcation group with 10.8±7.7% in the bifurcation group and 15.3±6.0% in the non-bifurcation group ($p<0.01$). NC/DC was significantly higher in the bifurcation group with 2.39±2.12 compared to 0.74±0.39 in the non-bifurcation group ($p<0.01$). Regarding NC distribution at the bifurcation, NC was present on the SB side in 85% (45/53) and on the opposite side of the SB in 15% (8/53), with greater distribution of NC on the SB side. In addition, NC/DC was 2.91±2.59 in lesions with a SB bifurcation angle under 45°(n=25), and 1.96±1.38 in lesions with a SB bifurcation angle of 45°or more (n=28), with a tendency for higher NC/DC ratio in lesions with a SB bifurcation angle under 45°($p=0.10$).

Conclusions: Bifurcations showed high vulnerability, and large distribution of NC was revealed on the side branch side. The possibility was suggested that the vulnerability of the main vessel increases with an decreasing angle of the side branch bifurcation.